

REMARKS/ARGUMENTS

Claims 1-104, and 110 stand canceled.

Claim 108 is currently amended. Support for the amendment is provided, for example, in the specification at page 7, lines 4-6. Claim 111 is currently amended to correct a typographical error.

Claims 114-132 are requested to be added. Support for new claims 114, 117, 120, 123, 126, and 130 is provided, for example, in original claim 46; in the specification at page 6, lines 17-22; in the specification at page 19, line 29 to page 20, line 2; and in the specification at page 20, lines 2-4 and lines 12-16. Support for new claims 115, 118, 121, 124, 127 and 131 is provided, for example, in original claims 3 and 40; in the specification at page 3, lines 7-10; and in the specification at page 20, lines 12-14. Support for new claims 116, 119, 122, 125, and 128 is provided, for example, in original claims 3 and 49, and in the specification at page 3, lines 7-13. Support for new claim 129 is provided, for example, in original claim 33; in the specification at page 6, lines 23-27; and in the specification at page 7, lines 4-6. Support for new claim 132 is provided, for example, in original claims 3, 34, and 49; in the specification at page 3, lines 7-13; and in the specification at page 6, line 27 to page 7, line 1.

This Amendment does not add new matter and otherwise is proper. The Amendment leaves claims 105-109, and 111-132 pending, and reconsideration in view of the following remarks is respectfully requested.

Claim 105 has been rejected under 35 U.S.C. §103(a) over Fischer U.S. Patent 5,800,706. The Examiner notes that Fischer '706 is silent as to a third set of coarse fibers, and that it would have been obvious to add the extra grouping of fibers as it has been held that *mere duplication* of essential working parts of a device involves only routine skill in the art. In response, it is firstly respectfully noted that the defined third set of fibers in claim 105 is not a *mere duplication*, but instead requires an entirely different size range of fibers, namely in the diameter range 10 to 15 μm , whereas the defined second set of fibers are in the diameter range 1 to 5 μm . It is thus respectfully submitted that the required third set of fibers in claim 105 is not a mere

duplication to provide an extra grouping of fibers, but instead requires a third set of fibers of an entirely different diameter range.

Claim 105 further requires the noted first, second and third sets of fibers in different ranges which do not overlap and which have size gaps therebetween. Claim 105 requires the first set of fibers to be in the diameter range 50 to 500 nm (0.05 to .5 μm), and a second set of fibers in the diameter range 1 to 5 μm , and a third set of fibers in the diameter range 10 to 50 μm . The Examiner is respectfully requested to note that there is a size gap between the largest diameter of the first set and the smallest diameter of the second set, namely a size gap of 0.5 μm between the respective ranges. Claim 105 also requires a size gap between the largest diameter fiber of the second set and the smallest diameter fiber of the third set, namely a size gap of 5 μm between the respective ranges of the second and third sets. These three sets of different diameter ranges are distinct from each other and do not overlap, and further have respective gaps therebetween. These distinctions are not taught nor suggested in Fischer '706, and do not involve mere duplication. Thus, Fischer '706 does not teach or suggest that the recited third set of fibers. Reconsideration and allowance of claim 105 are requested.

Claims 106 and 107 have been rejected under 35 U.S.C. §102(b) over Fischer '706. Applicant appreciates the Examiner's comments regarding differing wettability in the prior art. However, the Examiner's position appears to be that any teaching in the art whereby a first material is used for coarse fibers and a second different material is used for nanofibers will inherently meet the limitations recited in claims 106 and 107. This is not so. First, claims 106 and 107 require more than differential wettability with respect to the coarse fibers and the nanofibers. The claims recite that the differential wettability results in a wettability gradient that must be sufficient to create a capillary pressure gradient that wicks the droplets off of the coarse fibers or the nanofibers to facilitate coalescence and drainage. Thus, the materials of the coarse fiber and the nanofibers must not only be different but also must have wettabilities that differ sufficiently enough to create the recited capillary pressure gradient. Simply using different material for the coarse fibers and the

nanofibers will not necessarily result in a wettability gradient that is sufficient to create the recited capillary pressure gradient.

Furthermore, Fischer '706 does not teach or suggest that the scaffold particulate and the nanofiber must have different compositions. Fischer '706 merely states that "[the scaffold] particulate can have the same or different composition than the nanofiber." (See Fischer '706, col. 7, lines 41-42 (emphasis added).) Fischer '706 does not even suggest that it is preferable that the scaffold particulate and nanofiber have a different composition. The only actual example in Fischer where the scaffold particulate and nanofiber are of different compositions is a carbon fibril/fiberglass composite example. (See Example IV). The other disclosed, actual examples in Fischer '706 relate to carbon fibril/carbon fiber composites. (See Example V).

According to MPEP 2112 (iv), simply noting the fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. It is respectfully submitted that the requirement in MPEP 2112 that the "inherent characteristic necessarily flows from the teachings of the applied prior art" is not met. In fact, Applicant has reviewed the prior art, but is unable to identify a teaching of such differing wettability creating a differential wettability gradient which results in a capillary pressure gradient wicking droplets off the respective fibers and facilitating coalescence within and drainage from the defined internal structure. For these reasons, reconsideration and allowance of claims 106 and 107 is respectfully requested.

Claim 108 has been rejected under 35 U.S.C. §102(b) over Fischer '706. The Examiner asserts that Fischer '706 teaches the combination of a ceramic scaffold particulate which is insulative, and carbon nanofibers which are conductive. First, the limitations recited in claim 108 relate to ***surface charge characteristics*** of the coarse fibers and nanofibers for creating a localized electric field and enhancing filtration, not ***electric properties*** for insulating and conducting a current. Claim 108 recites "said nanofibers and said coarse fibers having sufficiently different surface charge characteristics in a filter fluid providing a localized electric field within said internal structure enhancing particle removal from filtered fluid." Therefore, claim 108 requires selecting

materials for the nanofibers and coarse fibers in order to create a charge differential in a given fluid to provided a localized electric field in the filter media and enhance filtration. Fischer '706 does not teach or suggest selecting different materials for nanofibers and coarse fibers according to claim 108. In fact, Fischer '706 does not even teach or suggest that the use of different materials for the scaffold particulate and the nanofibers is necessary or even preferable. For these reasons, reconsideration and allowance of claim 108 are respectfully requested.

Claim 109 has been rejected under 35 U.S.C. §102(b) over Fischer '706. Claim 109 requires that the filter media have upstream and downstream faces normal to flow therethrough, and that the nanofibers have first portions extending parallel to one of the faces and have second portions extending normal to such face. Claim 109 requires that the second nanofiber portions are continuous with the first nanofiber portions and extend into the internal structure normal to the noted face and increase attachment strength to the defined coarse fibers and reduce de-lamination risk of nanofibers and reduce pressure drop of fluid flow through the internal structure within the single layer due to increased orientation of nanofibers in the direction of fluid flow normal to the noted face.

Applicant appreciates the Examiner's comments regarding Fischer '706 at the bottom of page 5 of the Office Action directing applicant to another embodiment described by Fischer which provides for uniform distribution of nanofibers throughout the packed bed (Col. 9, lines 15-30). The Examiner asserts that this embodiment provides for the structural limitations set forth in claim 109. In response, the Examiner's attention is respectfully directed to the cited passage in Fischer '706, Col. 9, lines 15-30, noting isotropic physical properties. According to Fischer '706, "‘isotropic’ means that all measurements of a physical property within a plane or volume of the packed bed, independent of the direction of the measurement, are of constant value." (See col. 3, lines 27-30.) In contrast, applicant's structure is not isotropic. Claim 109 specifically requires that the second nanofiber portions extend into the internal structure normal to the noted face, and hence normal to the first nanofiber portions which are required to be parallel to the noted face. Claim 109 requires the noted further characteristics which make such structure anisotropic. Namely, the

second nanofiber portions increase attachment strength to the coarse fibers and reduce delamination risk of the nanofibers and reduce pressure drop of fluid flow through the internal structure parallel to the second nanofiber portions and perpendicular to the first nanofiber portions, and, as specifically set forth in claim 109, due to increased orientation of nanofibers, namely at the defined second portions thereof, in the direction of fluid flow normal to the noted face. This is in direct contradistinction to Fischer '706 having isotropic physical properties. For these reasons, reconsideration and allowance of claim 109 are respectfully requested.

Claim 129 is newly added and recites “said nanofibers and said coarse fibers are provided by first and second fiber types of different materials far enough apart in the triboelectric series to produce a charge when used together and having different surface charge characteristics providing a localized electric field within said internal structure enhancing particle removal from filtered fluid.” Therefore, the limitations recited in claim 129 relate to ***triboelectric properties*** for enhancing filtration, not ***electric properties*** for insulating and conducting a current. Fischer '706 does not teach or suggest a filter media having the triboelectric properties recited in claim 129. In fact, Fischer '706 does not even teach or suggest that the use of different materials for the scaffold particulate and the nanofibers is necessary or even preferable. For these reasons, consideration and allowance of claim 129 are respectfully requested.

Claims 111-113 depend from claim 105 and are believed allowable for the reasons noted above. Furthermore, these claims define subcombinations which are not taught or suggested by Fischer '706.

Claims 114, 117, 120, 123, 126, and 130 depend from claims 105-109 and 129, respectively and are believed allowable for the reasons noted above. Furthermore, these claims recite that the nanofibers are flexible. Fischer '706 does not teach or suggest the use of nanofibers that are flexible.

Claims 115, 118, 121, 124, 127, and 130 depend from claims 105-109 and 129, respectively and are believed allowable for the reasons noted above. Furthermore, these claims

recite that the nanofibers are polymeric. Fischer '706 does not teach or suggest the use of nanofibers that are polymeric.

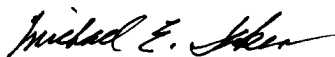
Claims 116, 119, 122, 125, and 128 depend from claims 105-109, respectively, and are believed allowable for the reasons noted above. Furthermore, these claims recite that the "coarse fibers are selected from the group consisting of ceramic materials, titania, glass, alumina, and silica" and that the "nanofibers are selected from the group consisting of polymeric halocarbon, polyester, polyaramid, polyphenylsulfide, acrylic, and nylon." Fischer '706 does not teach or suggest the use of the recited combination of materials.

Claim 132 depends from claim 129 and is believed allowable for the reasons noted above. Furthermore, this claim recites that "one of said first and second fiber types is selected from the group consisting of nylon, polyaramid, and cellulose; and the other of said first and second fiber types is selected from the group consisting of acrylic, polyester, polypropylene, and polymeric halocarbon." Fischer '706 does not teach or suggest the use of the recited combination of materials.

It is believed that this application is in condition for allowance with claims 105-109, and 111-132, and such action is earnestly solicited.

Respectfully submitted,

ANDRUS, SCEALES, STARKE & SAWALL, LLP



Michael E. Taken
(Reg. No. 28,120)



M. Scott McBride
(Reg. No. 52,008)

100 East Wisconsin Avenue, Suite 1100
Milwaukee, Wisconsin 53202
(414) 271-7590